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DERWENT-WEEK: 199814

TITLE: Image reading apparatus such as scanner with selective reading function for facsimile, copier has planar glass arranged along optical path such that reflected light from document surface forms image in same position during reading of set and conveyed document

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CIPS	H04 N 1/107 20060101
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ABSTRACTED-PUB-NO: JP 10023227 A

BASIC-ABSTRACT:

The apparatus performs reading of a document (S) fixed on a contact glass (19) and a document (P) conveys using an ADF unit (11) selectively. The reading position of the conveyed document is set higher than the set document during reading operation. A parallel planar glass (20) is arranged in the optical path during document transit operation such that the reflected light from the document surface (q) forms an image in the same position during set and conveyed document reading operation.

ADVANTAGE - Prevents difference in reading quality.

CHOSEN-DRAWING: Dwg.1/7

TITLE-TERMS: IMAGE READ APPARATUS SCAN SELECT FUNCTION FACSIMILE COPY PLANE GLASS ARRANGE OPTICAL PATH REFLECT LIGHT DOCUMENT SURFACE FORM POSITION SET CONVEY

DERWENT-CLASS: P82 P84 S06 W02

EPI-CODES: S06-A03G; W02-J01X; W02-J05A;

SECONDARY-ACC-NO:
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TITLE: IMAGE READER

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ABSTRACT:

PROBLEM TO BE SOLVED: To prevent read quality of a scanning original from deteriorating and to make the image reader small in which set original reading that reads a set original set on a contact glass or scanning original reading that reads a running original carried by an automatic draft feeder(ADF) is selectively conducted.

SOLUTION: An ADF original glass 30 is provided between carrier rollers 25, 26, close to the height position of a discharge tray 21 of an ADF 11 and the installed position is set higher than a contact glass 19 by Δd. On the other hand, a parallel flat glass 20 is provided beneath the ADF original glass 30 of the device main body 10. In the case of reading a running original, a light from a light source 13 strikes on an original face (q), higher than the contact glass 19 by Δd, and its reflected light B2 is formed and the optical path length of the reflected light B2 is extended by passing the reflected light B2 through the parallel flat glass 20, to form an image at the same image-forming position A as that set at original reading.

FULL CONTENTS

[Claim(s)]
[Claim 1] In the image scanner which can perform alternatively set manuscript reading which reads the set manuscript which carried out the fixed set on contact glass, and run manuscript reading which reads the run manuscript conveyed with ADF equipment While making the read position at the time of said run manuscript reading higher than the reading side at the time of said set manuscript reading The image scanner which arranges parallel planes glass in the middle of the optical path at the time of said run manuscript reading so that the reflected light from a manuscript surface may carry out image formation in the same position in the time of said set manuscript reading and said run manuscript reading.
[Claim 2] The image scanner according to claim 1 which carries said parallel planes glass in the run object which moves along said set manuscript surface at the time of said set manuscript reading, and evacuates the parallel planes glass out of an optical path at the time of said set manuscript reading.
[Claim 3] The image scanner according to claim 1 or 2 separately equipped with the 1st light source which irradiates said set manuscript surface top at the time of said set manuscript reading, and the 2nd light source which irradiates said run manuscript surface top at the time of said run manuscript reading, respectively.

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to image scanners, such as scanner facsimile and a copying machine. In detail, it has ADF equipment (automatic manuscript transport device), and is related with the image scanner which can perform alternatively reading of the set

manuscript which carried on contact glass, and reading of the run manuscript sent in with ADF equipment.

[0002]

[Description of the Prior Art] Conventionally, as shown, for example in drawing 7 , there are some which carry ADF equipment 2 on the main part 1 of equipment in this kind of image scanner.

[0003] Such a image scanner forms the run object 3 which carries optical units, such as the light source 3a, in the interior of the main part 1 of equipment free [movement] in the horizontal direction in a figure, and in the upper surface section Contact glass 4, While forming long and slender ADF manuscript glass 5 along with the edge, the long and slender manuscript guide member 7 is formed among these glass 4-5.

[0004] On the other hand, the discharging tray 8 and its upper part are equipped with the manuscript tray 9, and ADF equipment 2 is equipped with separation roller a, conveyance roller b, and the conveyance roller c which the flip vertical of the run manuscript P on the manuscript tray 9 is made to carry out on the left-hand side of [in a figure] these trays 8-9, and is conveyed to the reading station f on ADF manuscript glass 5 on it.

[0005] When reading a set manuscript, open ADF equipment 2, set a set manuscript on contact glass 4, and And after, After closing ADF equipment 2 and pressing down the set manuscript, the start switch was pushed, light was applied to the set manuscript from the light source 3a, moving the run object 3, the reflected light was further reflected by mirror 3b and 3c, and image formation was put in and carried out to the photoelectric transducer 3e through Lens 3d.

[0006] On the other hand while pushing a start switch, moving the run object 3 and stopping in the lower part of the run manuscript reading station f, after carrying out the loading set of the run manuscript P on the manuscript tray 9 when reading the run manuscript P It conveys to the run manuscript reading station f by conveyance roller b-c, rotating a pickup roller 6, letting out the run manuscript P, and separating one run manuscript P at a time by separation roller a. And when the tip of the run manuscript P is detected by the sensor which is not illustrated, light is applied to the run manuscript P from the light source 3a, and image formation of the reflected light is similarly put in and carried out to the photoelectric transducer 3e. After reading, it showed the run manuscript P to slanting facing up by the manuscript guide member 7, and the stack was discharged and carried out on the discharging tray 8 with the discharge roller 8a.

[0007]

[Problem to be solved by the invention] However, in such a conventional image scanner, the manuscript guide member 7 which shows the run manuscript P after reading to the height position of the discharging tray 8 is needed, and there is a problem that equipment becomes

large-sized in the move direction of the run object 3 so much.
[0008] Moreover, although the conveyance roller c with which ADF equipment 2 is equipped is formed in the position which does not contact the main part 1 of equipment which is comparatively separated from the run manuscript reading station f Now, at the time of conveyance of the run manuscript P, the run manuscript P bent, it was easy to come floating between the conveyance roller c and the run manuscript reading station f, and, as a result, there was a problem that the read quality of the run manuscript P deteriorated.
[0009] Then, in the image scanner which carries ADF equipment as mentioned above, there is the purpose of this invention in preventing that the read quality of a run manuscript deteriorates while attaining the miniaturization of equipment.
[0010]
[Means for solving problem] therefore, [invention according to claim 1] like the form of operation shown, for example in the following drawing 1 - drawing 3 In the image scanner which can perform alternatively set manuscript reading which reads the set manuscript S which carried out the fixed set on contact glass 19, and run manuscript reading which reads the run manuscript P conveyed with ADF equipment 11 While making the read position at the time of said run manuscript reading higher than the reading side at the time of said set manuscript reading Parallel planes glass 20 is arranged in the middle of the optical path at the time of said run manuscript reading so that reflected-light B1 and B-2 from manuscript surface p-q may carry out image formation in the same position A in the time of said set manuscript reading and said run manuscript reading, and it is characterized by things.
[0011] [invention according to claim 2] like the form of operation shown, for example in the following drawing 4 - drawing 6 In a image scanner according to claim 1, said parallel planes glass 40 is carried in the run object 12 which moves along said set manuscript surface p at the time of said set manuscript reading, and at the time of said set manuscript reading, the parallel planes glass 40 is evacuated out of an optical path, and it is characterized by things.
[0012] [invention according to claim 2] like the form of operation shown, for example in the following drawing 4 - drawing 6 In a image scanner according to claim 1 or 2, it has separately the 1st light source 35 which irradiates said set manuscript surface p top at the time of said set manuscript reading, and the 2nd light source 50 which irradiates said run manuscript surface q top at the time of said run manuscript reading, respectively, and is characterized by things.
[0013] And at the time of set manuscript reading, parallel planes glass 40 is made into an evacuation position, the 1st light source 35 is turned on, light is irradiated at the set manuscript S, at the time of run manuscript reading, parallel planes glass 40 is moved onto an optical path from an evacuation position, the 2nd light source 50 is turned on, and light is irradiated at the run manuscript P.
[0014]

[Mode for carrying out the invention] The form of implementation of this invention is explained hereafter, referring to Drawings. Drawing 1 shows the form of implementation of invention indicated to Claim 1, and is the outline block diagram of the image scanner.
[0015] This image scanner carries the ADF equipment 11 which can be freely opened and closed on the main part of equipment shown with the sign 10 in a figure.
[0016] Contact glass 19 is formed in the upper surface, and the run object 12 which drives the motor which is not illustrated inside and moves to the horizontal direction in a figure is formed in the main part 10 of equipment. The read circuit substrate 18 which attaches the light source 13 like light emitting diode or a fluorescent light, a mirror 14-15, a lens 16, the photoelectric transducer 17, and its photoelectric transducer 17 is carried in the run object 12.
[0017] Furthermore, the edge is applied to the left in a figure of contact glass 19, and the parallel planes glass 20 of long and slender thickness d is formed in the main part 10 of equipment. Parallel planes glass 20 is arranged in the move direction of the run object 12, and the direction which intersects perpendicularly, unites the upper surface with the upper surface of contact glass 19, and establishes it in the same height position.
[0018] On the other hand, the ADF equipment 11 on this main part 10 of equipment is equipped with the discharging tray 21 located on contact glass 19, and the manuscript tray 22 which carries out the loading set of the run manuscript P in that upper part. Moreover, the carrying path 27 which the flip vertical of the run manuscript P is made to carry out on the left-hand side of [in a figure] these trays 21-22, and conveys it to the discharging tray 21 on it is formed in the direction of figure Nakaya mark C, and the separation roller 23 of a pair, the conveyance roller 24, the conveyance roller 25, and the conveyance roller 26 are respectively formed in the transportation direction C in order at the carrying path 27.
[0019] And the conveyance roller 25-26 is arranged near the height position of the discharging tray 21, and ADF manuscript glass 30 is formed in the conveyance roller 25 slippage between these rollers 25.26. ADF manuscript glass 30 consists of a glass board with the same long and slender thickness as contact glass 19, and is arranged to it and parallel right above parallel planes glass 20. and the installation position of ADF manuscript glass 30 -- contact glass 19 -- deltad -- it is made high.
[0020] In the image scanner which carried out the deer and which was mentioned above, when reading a set manuscript, ADF equipment 11 is opened, and a set manuscript is carried and set on contact glass 19. After closing ADF equipment 11 and pressing down a set manuscript after a set, as the start switch which is not illustrated is pushed and it is shown in drawing 2 Light is applied to the manuscript surface p of the set manuscript S from the light source 13, moving the run object 12, it reflects further by a mirror 14-15, and image formation of the reflected light B1 is put in and carried out to the photoelectric transducer 17 through a lens 16.
[0021] As it is got blocked, for example, is shown in drawing 3 , image formation of the

reflected light B1 hit and reflected in the manuscript surface p is carried out to the image formation position A through the optical path of length L. A deer is carried out, a reflected light B1 is changed into an electrical signal by the photoelectric transducer 17, and read is performed.

[0022] On the other hand, when reading the run manuscript P, as shown in drawing 1 , the run manuscript P is loaded on the manuscript tray 22, and the tip section is put in and set between a pickup roller 31 and the manuscript tray 22. While pushing the above-mentioned start switch after a set, moving the run object 12 and stopping in the lower part position of ADF manuscript glass 30 A pickup roller 31 is rotated and it lets out the run manuscript P, and the separation roller 23 separates the run manuscript P, and it sends one sheet at a time into a carrying path 27, and conveys with the conveyance roller 24-25 through the carrying path 27. And when the tip of the run manuscript P is detected by the sensor which is not illustrated, light is applied to the run manuscript P through parallel planes glass 20 from the light source 13. It reflects further by a mirror 14-15 through parallel planes glass 20 again, and image formation of the reflected-light B-2 is put in and carried out to the photoelectric transducer 17 through a lens 16, and by the photoelectric transducer 17, reflected-light B-2 is changed into an electrical signal, and it reads.

[0023] in this case, it is shown in drawing 3 -- as -- the manuscript surface q of the run manuscript P -- the manuscript surface p of the set manuscript S -- deltad -- it is in a high position. However, since it is deltad=d (1-1/n) when n is made into the refractive index of parallel planes glass at this time, by this principle [reflected-light B-2 from a manuscript surface q] When it passes along the parallel planes glass 20 of thickness d in the middle of the optical path, the optical path length does image formation to the same image formation position A as the time of set manuscript reading through distance between manuscript surfaces p.q deltad, corresponding length growth, as a result its elongated optical path.

[0024] After an appropriate time, the run manuscript P after reading is discharged to the discharging tray 21 with the conveyance roller 26 shown in drawing 1 , and a stack is carried out on the discharging tray 21 one by one.

[0025] By the way, in invention according to claim 2, parallel planes glass is carried in the run object which moves along a set manuscript surface at the time of set manuscript reading, and it has composition which evacuates the parallel planes glass out of an optical path at the time of set manuscript reading. Furthermore, in invention according to claim 3, it has composition separately equipped with the 1st light source which irradiates a set manuscript surface top at the time of set manuscript reading, and the 2nd light source which irradiates a run manuscript surface top at the time of run manuscript reading, respectively.

[0026] For example, as shown in drawing 4 , the contact glass 19 of thickness d1 is formed in the upper surface of the main part 10 of equipment, and the 1st light source 35 of set

manuscript read-only is carried in the internal run object 12. Furthermore, on the run object 12, the parallel planes glass 40 of thickness d2 is arranged between a mirror 15 and a lens 16. The thickness d2 of the parallel planes glass 40 and the thickness d1 of contact glass 19 consist of the same glass material used as d1+d2=d. And parallel planes glass 40 is held by a holder 41. A holder 41 supports with the run object 12 free [rotation] focusing on Pivot 41a. and -- for example, a holder 41 is rotated using the solenoid which is not illustrated and movement of parallel planes glass 40 in the optical-path position of the figure inner substance line which lets a reflected light pass, and the evacuation position of the figure middle point line which separated from the optical-path position is enabled.

[0027] on the other hand -- ADF equipment 11 -- the left end section upper part in a figure of contact glass 19 -- it -- deltad -- ADF manuscript glass 30 is formed in a high position. And the 2nd light source 50 of run manuscript read-only is carried among these glass 19.30.

[0028] And when reading the set manuscript S, the above-mentioned solenoid is turned on, for example, a holder 41 is rotated to the counterclockwise rotation in drawing 5 , and it is made to move to the evacuation position which separated from parallel planes glass 40 from the optical path. And the 1st light source 35 is turned on and the light is switched on, light is applied to the manuscript surface p of the set manuscript S, moving the run object 12, it reflects further by a mirror 14-15, and image formation of the reflected light B3 is put in and carried out to the photoelectric transducer 17 through a lens 16.

[0029] On the other hand, while considering it as the lower part position of ADF manuscript glass 30 as shown in drawing 4 when reading a run manuscript, the above-mentioned solenoid is turned off, a holder 41 is clockwise rotated among drawing 4 , and parallel planes glass 40 is moved to an optical-path position from an evacuation position. And the 2nd light source 50 is turned on, the light is switched on, and light is applied to the manuscript surface q of the run manuscript P passing through the ADF-manuscript-glass 30 top, and after reflecting the reflected-light B4 further by a mirror 14-15 and the back's letting parallel planes glass 40 pass, image formation is further put in and carried out to the photoelectric transducer 17 through a lens 16.

[0030] in this case, the manuscript surface q of the run manuscript P -- the manuscript surface p of the set manuscript S -- deltad -- although it is in a high position As shown in drawing 6 , [reflected-light B4 from a manuscript surface q] When it passes along the contact glass 19 of thickness d1, and the parallel planes glass 40 of thickness d2 in the middle of the optical path, the optical path length does image formation to the same image formation position A as the time of set manuscript reading through distance between manuscript surfaces p.q deltad, corresponding length growth, as a result its elongated optical path.

[0031]

[Effect of the Invention] Therefore, according to invention according to claim 1 to 3, it sets to

the image scanner which reads reading of a set manuscript and the run manuscript sent in from ADF equipment. Since the read position of a run manuscript is established in a position higher than the reading side of a set manuscript, the manuscript guide member which reads so that it may be the former, and shows a next run manuscript to the height position of a discharging tray becomes unnecessary, and the miniaturization of equipment can be attained so much.

[0032] [moreover, the thing for which the read position of a run manuscript is made higher than the reading side of a set manuscript] [can approach the read position of a run manuscript, can arrange the conveyance roller which conveys a run manuscript, and / bending and coming-floating / a run manuscript /-between conveyance roller and run manuscript reading station ****] at the time of conveyance of a run manuscript like before as a result It can also prevent that the read quality of a run manuscript deteriorates.

[0033] In addition, although the read position of a run manuscript is established in a position higher than the reading side of a set manuscript such in invention according to claim 1 to 3 Even in such a case, since the same image formation position as the time of reading of a set manuscript is made to carry out image formation when only the distance made high lengthens the optical path length for a long time through the reflected light from the manuscript surface to parallel planes glass at the time of run manuscript reading, it can avoid producing a difference in read quality.

[Brief Description of the Drawings]

[Drawing 1] The form of implementation of invention indicated to Claim 1 is shown, and it is the outline block diagram of the image scanner.

[Drawing 2] It is the state explanatory view showing the state at the time of reading of the set manuscript by the image scanner.

[Drawing 3] It is the explanatory view which compares the optical path length at the time of the set manuscript reading and run manuscript reading, and is explained.

[Drawing 4] The form of implementation of invention indicated to Claim 2 is shown, and it is the outline block diagram of the image scanner.

[Drawing 5] It is the state explanatory view showing the state at the time of reading of the set manuscript by the image scanner.

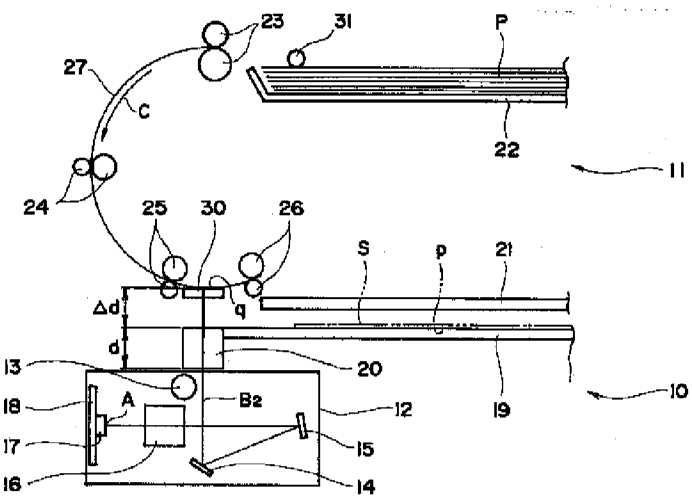
[Drawing 6] It is an explanatory view explaining the growth of the optical path length at the time of run manuscript reading by the image scanner.

[Drawing 7] It is the outline block diagram of the conventional image scanner.

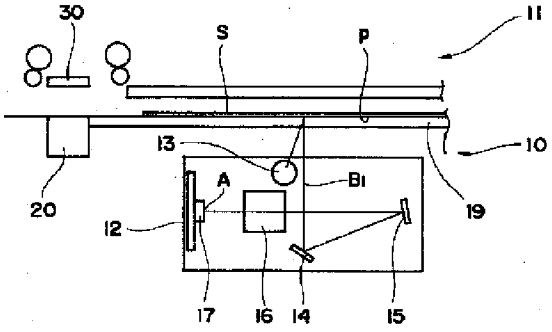
[Explanations of letters or numerals]

11 ADF Equipment
12 Run Object
13 Light Source
19 Contact Glass
30-40 Parallel planes glass
35 1st Light Source
50 2nd Light Source
A Image formation position
B1 - B4 Reflected light
P Run manuscript
S Set manuscript
p-q Manuscript surface

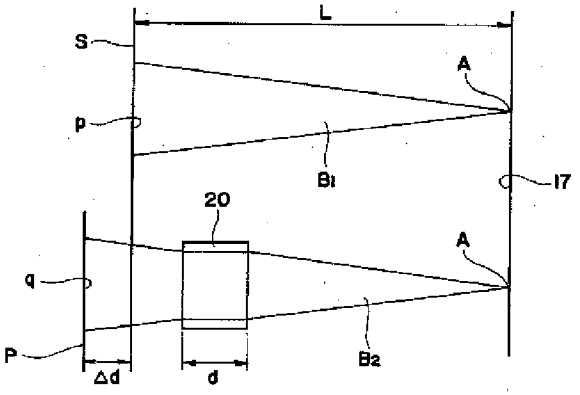
[Drawing 1]



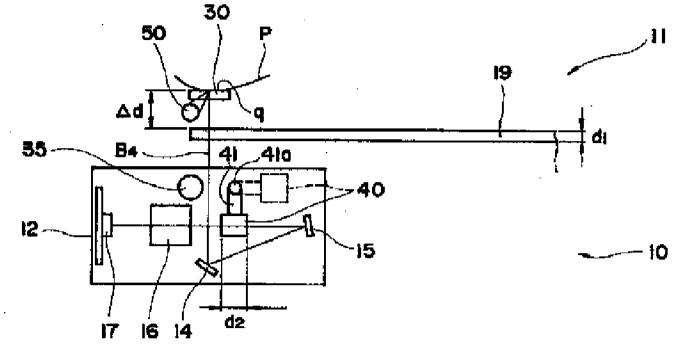
[Drawing 2]



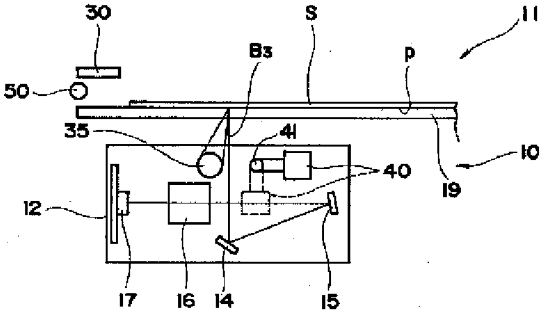
[Drawing 3]



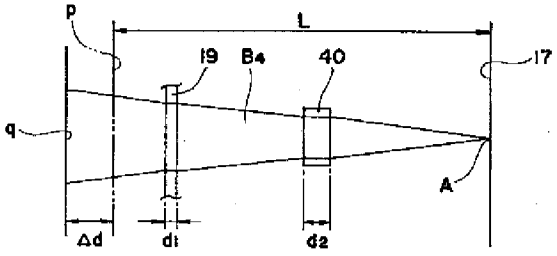
[Drawing 4]



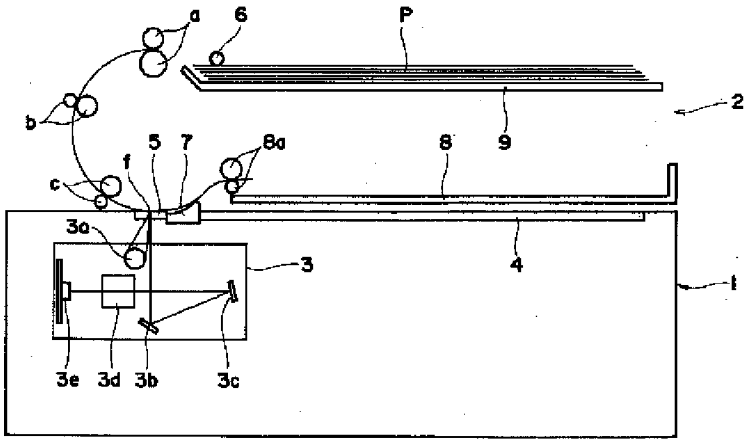
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]

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Ｇ０３Ｇ　15/00	１０７		Ｇ０３Ｇ　15/00	１０７	
15/04			15/04		
Ｈ０４Ｎ　1/10			Ｈ０４Ｎ　1/10		

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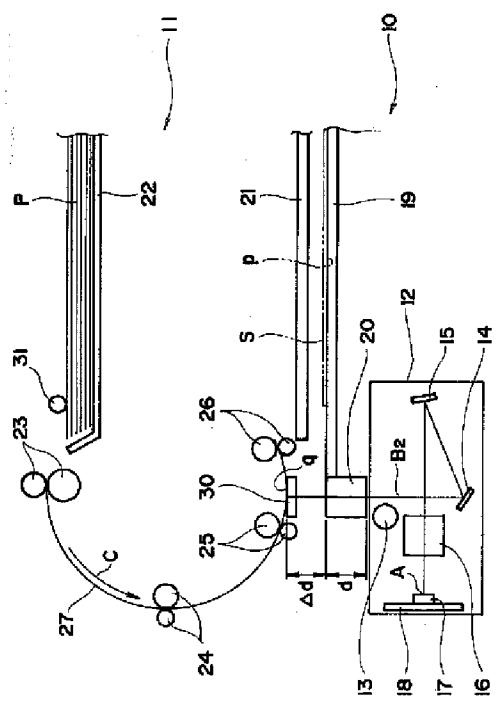
(54)【発明の名称】　画像読取装置

(57)【要約】
【課題】　コンタクトガラス上に固定セットしたセット原稿の読み取りを行うセット原稿読み取りとＡＤＦ装置で搬送する走行原稿の読み取りを行う走行原稿読み取りとを選択的に行える画像読取装置において、装置の小型化を図るとともに、走行原稿の読取品質の低下を防止する。
【解決手段】　ＡＤＦ装置１１の排出トレイ２１の高さ位置近くの搬送ローラ２５・２６間に、ＡＤＦ原稿ガラス３０を設け、その設置位置をコンタクトガラス１９よりΔｄ高くする。一方、装置本体１０に、ＡＤＦ原稿ガラス３０の真下に平行平面ガラス２０を設ける。そして、走行原稿読み取り時、光源１３からの光をコンタクトガラス１９よりΔｄ高い原稿面ｑに当ててその反射光B_2を結像させるが、そのとき、反射光B_2を平行平面ガラス２０に通して光路長を伸ばしてセット原稿読み取り時と同じ結像位置Ａで結像させる。



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【特許請求の範囲】

【請求項１】　コンタクトガラス上に固定セットしたセット原稿の読み取りを行うセット原稿読み取りとＡＤＦ装置で搬送する走行原稿の読み取りを行う走行原稿読み取りとを選択的に行うことができる画像読取装置において、前記走行原稿読み取り時の読み取り位置を前記セット原稿読み取り時の読み取り面よりも高くするとともに、原稿面からの反射光が前記セット原稿読み取り時と前記走行原稿読み取り時とで同じ位置で結像するように前記走行原稿読み取り時の光路途中に平行平面ガラスを配置してなる、画像読取装置。

【請求項２】　前記セット原稿読み取り時に前記セット原稿面に沿って移動する走行体に前記平行平面ガラスを搭載し、前記セット原稿読み取り時にはその平行平面ガラスを光路外に退避してなる、請求項１に記載の画像読取装置。

【請求項３】　前記セット原稿読み取り時に前記セット原稿面上を照射する第１光源と、前記走行原稿読み取り時に前記走行原稿面上を照射する第２光源とをそれぞれ別個に備えてなる、請求項１または２に記載の画像読取装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】この発明は、スキャナ・ファクシミリ・複写機などの画像読取装置に関する。詳しくは、ＡＤＦ装置（自動原稿搬送装置）を備え、コンタクトガラス上にのせたセット原稿の読み取りと、ＡＤＦ装置で送り込む走行原稿の読み取りとを選択的に行うことができる画像読取装置に関する。

【０００２】

【従来の技術】従来、この種の画像読取装置の中に、たとえば図７に示すように、装置本体１上にＡＤＦ装置２を搭載したものがある。

【０００３】このような画像読取装置は、装置本体１の内部に、光源３ａなどの光学ユニットを搭載した走行体３を図中左右方向に移動自在に設け、上面部に、コンタクトガラス４と、その端縁に沿って細長いＡＤＦ原稿ガラス５を設けるとともに、それらガラス４・５間に細長い原稿ガイド部材７を設ける。

【０００４】一方、ＡＤＦ装置２には、排出トレイ８とその上方に原稿トレイ９を備え、それらトレイ８・９の図中左側に、原稿トレイ９上の走行原稿Ｐを上下反転させてＡＤＦ原稿ガラス５上の読取位置ｆへ搬送する分離ローラａ・搬送ローラｂ・搬送ローラｃを備える。

【０００５】そして、セット原稿を読み取るとき、ＡＤＦ装置２を開き、コンタクトガラス４上にセット原稿をセットして後、ＡＤＦ装置２を閉じてセット原稿を押さえてから、スタートスイッチを押し、走行体３を移動しながらセット原稿に光源３ａから光を当て、その反射光をミラー３ｂ・３ｃでさらに反射し、レンズ３ｄを通して光電変換素子３ｅに入れて結像していた。

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【０００６】一方、走行原稿Ｐを読み取るときは、原稿トレイ９上に走行原稿Ｐを積載セットしてから、スタートスイッチを押し、走行体３を移動して走行原稿読取位置ｆの下方で止めるとともに、ピックアップローラ６を回転して走行原稿Ｐを繰り出し、分離ローラａで走行原稿Ｐを一枚ずつ分離しながら、搬送ローラｂ・ｃで走行原稿読取位置ｆへ搬送する。そして、図示しないセンサで走行原稿Ｐの先端を検知したとき、その走行原稿Ｐに光源３ａから光を当て、その反射光を、同様に光電変換素子３ｅに入れて結像する。読み取り後、走行原稿Ｐを原稿ガイド部材７で斜め上向きに案内して排出ローラ８ａで排出トレイ８上に排出しスタックしていた。

【０００７】

【発明が解決しようとする課題】ところが、そのような従来の画像読取装置では、読み取り後の走行原稿Ｐを排出トレイ８の高さ位置へ案内する原稿ガイド部材７を必要とし、それだけ走行体３の移動方向に装置が大型になるという問題がある。

【０００８】また、ＡＤＦ装置２に備える搬送ローラｃを、走行原稿読取位置ｆから比較的離れた装置本体１に接触しない位置に設けるが、これでは、走行原稿Ｐの搬送時に、搬送ローラｃと走行原稿読取位置ｆとの間で走行原稿Ｐが撓んで浮き上がりやすく、その結果、走行原稿Ｐの読取品質が低下するという問題があった。

【０００９】そこで、この発明の目的は、上述のようにＡＤＦ装置を搭載した画像読取装置において、装置の小型化を図るとともに、走行原稿の読取品質が低下することを防止することにある。

【００１０】

【課題を解決するための手段】そのため、請求項１に記載の発明は、たとえば以下の図１～図３に示す実施の形態のように、コンタクトガラス１９上に固定セットしたセット原稿Ｓの読み取りを行うセット原稿読み取りとＡＤＦ装置１１で搬送する走行原稿Ｐの読み取りを行う走行原稿読み取りとを選択的に行うことができる画像読取装置において、前記走行原稿読み取り時の読み取り位置を前記セット原稿読み取り時の読み取り面よりも高くするとともに、原稿面ｐ・ｑからの反射光B_1・B_2が前記セット原稿読み取り時と前記走行原稿読み取り時とで同じ位置Ａで結像するように前記走行原稿読み取り時の光路途中に平行平面ガラス２０を配置してなる、ことを特徴とする。

【００１１】請求項２に記載の発明は、たとえば以下の図４～図６に示す実施の形態のように、請求項１に記載の画像読取装置において、前記セット原稿読み取り時に前記セット原稿面ｐに沿って移動する走行体１２に前記平行平面ガラス４０を搭載し、前記セット原稿読み取り時にはその平行平面ガラス４０を光路外に退避してなる、ことを特徴とする。

【００１２】請求項２に記載の発明は、たとえば以下の図４～図６に示す実施の形態のように、請求項１または２に記載の画像読取装置において、前記セット原稿読み取り時に前記セット原稿面ｐ上を照射する第１光源３５と、前記走行原稿読み取り時に前記走行原稿面ｑ上を照射する第２光源５０とをそれぞれ別個に備えてなる、ことを特徴とする。

【００１３】そして、セット原稿読み取り時、平行平面ガラス４０を退避位置とし、第１光源３５をオンしてセット原稿Ｓに光を照射し、走行原稿読み取り時、平行平面ガラス４０を退避位置から光路上に移動し、第２光源５０をオンして走行原稿Ｐに光を照射する。

【００１４】

【発明の実施の形態】以下、図面を参照しつつ、この発明の実施の形態について説明する。図１は、請求項１に記載した発明の実施の形態を示し、その画像読取装置の概略構成図である。

【００１５】この画像読取装置は、図中符号１０で示す装置本体上に開閉自在なＡＤＦ装置１１を搭載してなる。

【００１６】装置本体１０には、その上面に、コンタクトガラス１９を設け、内部に、図示しないモータを駆動して図中左右方向に移動する走行体１２を設ける。走行体１２には、発光ダイオードや蛍光灯のような光源１３と、ミラー１４・１５と、レンズ１６と、光電変換素子１７と、その光電変換素子１７を取り付ける読取回路基板１８を搭載してなる。

【００１７】さらに、装置本体１０には、コンタクトガラス１９の図中左横に、その端縁を当てて細長い厚さｄの平行平面ガラス２０を設ける。平行平面ガラス２０は、走行体１２の移動方向と直交する方向に配置し、上面をコンタクトガラス１９の上面に合わせて同じ高さ位置に設けてなる。

【００１８】一方、この装置本体１０上のＡＤＦ装置１１には、コンタクトガラス１９上に位置する排出トレイ２１と、その上方に走行原稿Ｐを積載セットする原稿トレイ２２を備える。また、それらトレイ２１・２２の図中左側に、走行原稿Ｐを上下反転させて排出トレイ２１へ搬送する搬送路２７を図中矢印Ｃ方向に形成し、その搬送路２７に、搬送方向Ｃに順に各々一対の分離ローラ２３、搬送ローラ２４、搬送ローラ２５、搬送ローラ２６を設けてなる。

【００１９】そして、搬送ローラ２５・２６を排出トレイ２１の高さ位置近くに配置し、それらローラ２５・２６間の搬送ローラ２５寄りに、ＡＤＦ原稿ガラス３０を設ける。ＡＤＦ原稿ガラス３０は、コンタクトガラス１９と同じ厚さの細長いガラス板からなり、平行平面ガラス２０の真上にそれと平行に配置してなる。そして、ＡＤＦ原稿ガラス３０の設置位置を、コンタクトガラス１９よりΔｄ高くしてなる。

【００２０】しかして、上述した画像読取装置では、セット原稿を読み取る場合、ＡＤＦ装置１１を開き、コンタクトガラス１９上にセット原稿をのせてセットする。セット後、ＡＤＦ装置１１を閉じてセット原稿を押さえてから、図示しないスタートスイッチを押し、図２に示すように、走行体１２を移動しながらセット原稿Ｓの原稿面ｐに光源１３から光を当て、その反射光B_1を、ミラー１４・１５でさらに反射してレンズ１６を通して光電変換素子１７に入れて結像する。

【００２１】つまり、たとえば図３に示すように、原稿面ｐに当たって反射した反射光B_1は、長さＬの光路を経て結像位置Ａに結像する。しかして、その光電変換素子１７で反射光B_1を電気信号に変換して読取りを行う。

【００２２】一方、走行原稿Ｐを読み取る場合は、図１に示すように、原稿トレイ２２上に走行原稿Ｐを積載し、その先端部をピックアップローラ３１と原稿トレイ２２間に入れてセットする。セット後、上記スタートスイッチを押し、走行体１２を移動してＡＤＦ原稿ガラス３０の下方位置で止めるとともに、ピックアップローラ３１を回転して走行原稿Ｐを繰り出し、分離ローラ２３で走行原稿Ｐを分離して一枚ずつ搬送路２７に送り込み、その搬送路２７を通して搬送ローラ２４・２５で搬送する。そして、図示しないセンサで走行原稿Ｐの先端を検知したとき、その走行原稿Ｐに光源１３から光を平行平面ガラス２０を通して当て、その反射光B_2を、再び平行平面ガラス２０を通してミラー１４・１５でさらに反射し、レンズ１６を通して光電変換素子１７に入れて結像し、その光電変換素子１７で反射光B_2を電気信号に変換して読み取りを行う。

【００２３】この場合、図３に示すように、走行原稿Ｐの原稿面ｑはセット原稿Ｓの原稿面ｐよりΔｄ高い位置にある。しかし、このとき、ｎを平行平面ガラスの屈折率とすると、Δｄ＝ｄ（１－１／ｎ）であるから、この原理により、原稿面ｑからの反射光B_2は、その光路途中で厚さｄの平行平面ガラス２０を通るとき、光路長が原稿面ｐ・ｑ間距離Δｄと対応する長さ伸び、その結果、その伸長した光路を経てセット原稿読み取り時と同じ結像位置Ａに結像する。

【００２４】しかる後、読取り後の走行原稿Ｐを、図１に示す搬送ローラ２６で排出トレイ２１へ排出し、順次その排出トレイ２１上にスタックする。

【００２５】ところで、請求項２に記載の発明では、セット原稿読み取り時にセット原稿面に沿って移動する走行体に平行平面ガラスを搭載し、セット原稿読み取り時にはその平行平面ガラスを光路外に退避させる構成とする。さらに、請求項３に記載の発明では、セット原稿読み取り時にセット原稿面上を照射する第１光源と、走行原稿読み取り時に走行原稿面上を照射する第２光源とをそれぞれ別個に備える構成とする。

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【００２６】たとえば図４に示すように、装置本体１０の上面に厚さd_1のコンタクトガラス１９を設け、内部の走行体１２に、セット原稿読み取り専用の第１光源３５を搭載する。さらに、走行体１２には、ミラー１５とレンズ１６との間に厚さd_2の平行平面ガラス４０を配置する。その平行平面ガラス４０の厚さd_2とコンタクトガラス１９の厚さd_1は、$d_1+d_2=d$となる同じガラス材からなる。そして、平行平面ガラス４０は、ホルダ４１で保持する。ホルダ４１は、支軸４１ａを中心として回動自在に走行体１２で支持する。そして、たとえば図示しないソレノイドを用いてホルダ４１を回動し、平行平面ガラス４０を、反射光を通す図中実線の光路位置とその光路位置から外れた図中点線の退避位置とに移動自在とする。

【００２７】一方、ＡＤＦ装置１１には、コンタクトガラス１９の図中左端部上方に、それよりΔｄ高い位置にＡＤＦ原稿ガラス３０を設ける。そして、それらガラス１９・３０間に、走行原稿読み取り専用の第２光源５０を搭載する。

【００２８】そして、セット原稿Ｓを読み取るとき、上記したソレノイドを、たとえばオンしてホルダ４１を図５中反時計方向に回動し、平行平面ガラス４０を光路から外れた退避位置に移動させる。そして、第１光源３５をオンして点灯し、走行体１２を移動しながらセット原稿Ｓの原稿面ｐに光を当て、その反射光B_3を、ミラー１４・１５でさらに反射し、レンズ１６を通して光電変換素子１７に入れて結像する。

【００２９】一方、走行原稿を読み取るときは、図４に示すように、ＡＤＦ原稿ガラス３０の下方位置とするとともに、上記ソレノイドをオフしてホルダ４１を図４中時計方向に回動し、平行平面ガラス４０を退避位置から光路位置へ移動させる。そして、第２光源５０をオンして点灯し、ＡＤＦ原稿ガラス３０上を通る走行原稿Ｐの原稿面ｑに光を当て、その反射光B_4を、ミラー１４・１５でさらに反射して後、平行平面ガラス４０を通してから、さらにレンズ１６を通して光電変換素子１７に入れて結像する。

【００３０】この場合、走行原稿Ｐの原稿面ｑがセット原稿Ｓの原稿面ｐよりΔｄ高い位置にあるが、図６に示すように、原稿面ｑからの反射光B_4は、その光路途中で厚さd_1のコンタクトガラス１９と厚さd_2の平行平面ガラス４０を通るとき、光路長が原稿面ｐ・ｑ間距離Δｄと対応する長さ伸び、その結果、その伸長した光路を経てセット原稿読み取り時と同じ結像位置Ａに結像する。

【００３１】

【発明の効果】したがって、請求項１～３に記載の発明によれば、セット原稿の読み取りと、ＡＤＦ装置から送り込む走行原稿の読み取りを行う画像読取装置において、セット原稿の読み取り面より高い位置に走行原稿の読み取り位置を設けるから、従来のよう読み取り後の走行原稿を排出トレイの高さ位置へ案内する原稿ガイド部材が不要となり、それだけ装置の小型化を図ることができる。

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【００３２】また、走行原稿の読み取り位置をセット原稿の読み取り面より高くすることで、走行原稿を搬送する搬送ローラを走行原稿の読み取り位置に近接して配置することができ、その結果、従来のように走行原稿の搬送時に、搬送ローラと走行原稿読取位置との間で走行原稿が撓んで浮き上がること防いで、走行原稿の読取品質が低下することを防止することもできる。

【００３３】なお、請求項１～３に記載の発明では、そのように走行原稿の読み取り位置をセット原稿の読み取り面より高い位置に設けるが、その場合でも、走行原稿読み取り時にその原稿面からの反射光を平行平面ガラスに通して光路長を、その高くした距離だけ長く伸ばすことにより、セット原稿の読み取り時と同じ結像位置に結像させるから、読取品質に差を生じないようにすることができる。

【図面の簡単な説明】

【図１】請求項１に記載した発明の実施の形態を示し、その画像読取装置の概略構成図である。

【図２】その画像読取装置によるセット原稿の読み取り時の状態を示す状態説明図である。

【図３】そのセット原稿読み取り時と走行原稿読み取り時の光路長を比較して説明する説明図である。

【図４】請求項２に記載した発明の実施の形態を示し、その画像読取装置の概略構成図である。

【図５】その画像読取装置によるセット原稿の読み取り時の状態を示す状態説明図である。

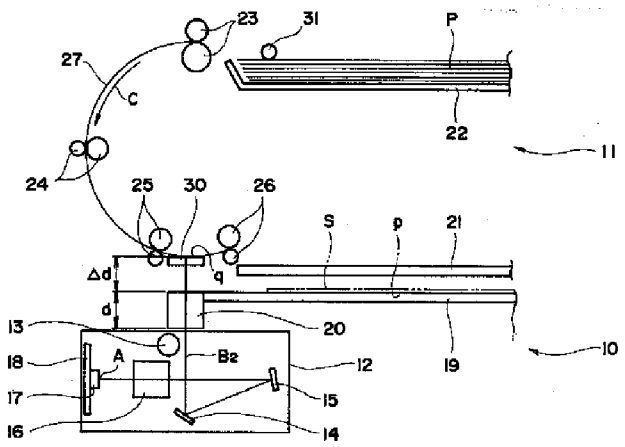
【図６】その画像読取装置による走行原稿読み取り時の光路長の伸びを説明する説明図である。

【図７】従来の画像読取装置の概略構成図である。

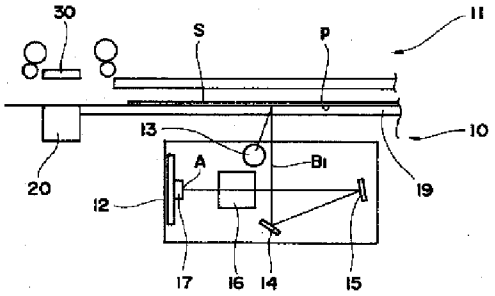
【符号の説明】

１１	ＡＤＦ装置
１２	走行体
１３	光源
１９	コンタクトガラス
３０・４０	平行平面ガラス
３５	第１光源
５０	第２光源
Ａ	結像位置
B_1～B_4	反射光
Ｐ	走行原稿
Ｓ	セット原稿
ｐ・ｑ	原稿面

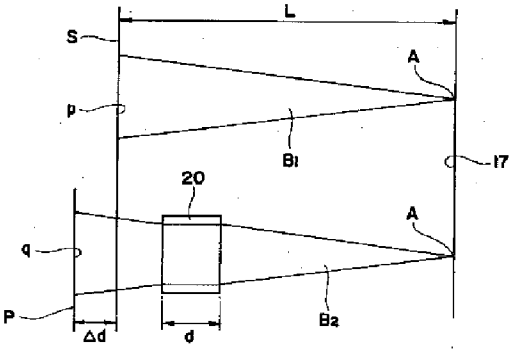
【図１】



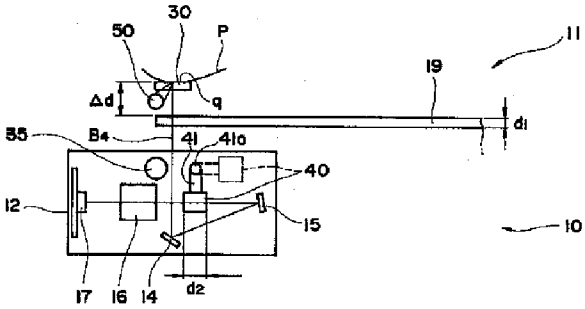
【図２】



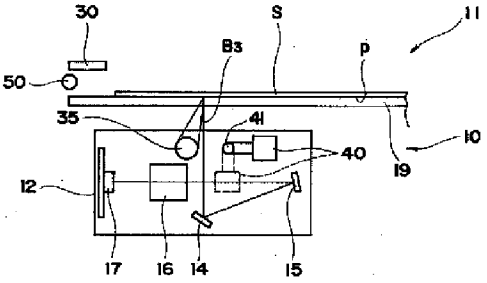
【図３】



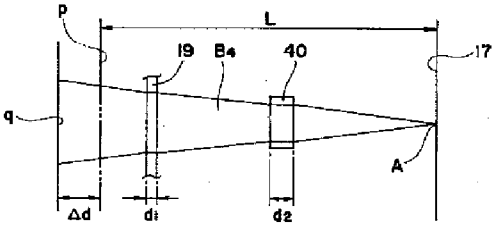
【図４】



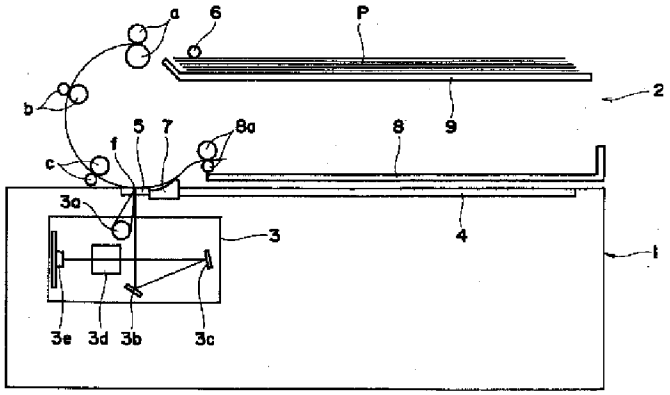
【図５】



【図６】



【図7】



フロントページの続き

(51)Int.Cl.[6]		識別記号	庁内整理番号	ＦＩ			技術表示箇所
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	1/04						